UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,999	12/21/2001	Andreas N. Dorsel	10992125-2	6346

7590 08/18/2005

AGILENT TECHNOLOGIES, INC.
Intellectual Property Administration
Legal Department, DL429
P. O. Box 7599
Loveland, CO 80537-0599

EXAMINER	
FORMAN, BETTY J	

ART UNIT	PAPER NUMBER
1634	

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/036,999	DORSEL ET AL.	
	Examiner	Art Unit	
	BJ Forman	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-11 and 18-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-11 and 18-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

FINAL ACTION

Status of the Claims

1. This action is in response to papers filed 2 May 2005 in which claims 1, 5, 7 and 18 were amended. The amendments have been thoroughly reviewed and entered. The previous rejections in the Office Action dated 4 February 2005, not reiterated below, are withdrawn in view of the amendments. Applicant's arguments have been thoroughly reviewed and are discussed below as they apply to the instant grounds for rejection. New grounds for rejection, necessitated by amendment, are discussed.

Claims 1-5, 7-11 and 18-20 are under prosecution.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 5, 7 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lehman et al (U.S. Patent No. 5,237,172, issued 17 August 1993) in view of Brower (U.S. Patent No. 5,167,704, issued 1 December 1992).

Regarding Claim 1, Lehman et al discloses a method comprising scanning an interrogating light across multiple sites on an array package wherein the package includes an addressable array of multiple features of different moieties (i.e. different lines on a document), detecting signals from scanned sites and decreasing power of interrogating light for a first site

during the scanning wherein the first site is outside the area occupied by the array (i.e. calibration scan lines #28/30, Column 5, lines 36-58 and Fig. 3-6). Lehman teaches document scanning wherein the document comprises lines comprised of letters (Column 2, lines 17-30) which clearly suggests the arrayed letters are ink on a page. Lehman does not specifically teach an ink composition. However, biopolymer inks were well known in the art at the time the claimed invention was made as taught by Brower who teach that soy ink is a general purpose and highly permanent ink (Column 1, line 58-Column 2, line 17). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to use the soy ink of Brower in the scanning device of Lehman based on its highly permanent characteristics as taught by Brower (Column 1, line 58-Column 2, line 17).

Regarding Claim 5, Lehman et al discloses a method comprising scanning light across multiple sites on an array, detecting signals from scanned sites emitted in response to the light and altering power of the light for a first site wherein the first site is an array feature and wherein the power is altered based on emitted signal from the first site (Column 3, lines 1-24; Column 5, line 22-Column 6, line 32; and Column 11, lines 3-47). Lehman teaches document scanning wherein the document comprises lines comprised of letters (Column 2, lines 17-30) which clearly suggests the arrayed letters are ink on a page. Lehman does not specifically teach an ink composition. However, biopolymer inks were well known in the art at the time the claimed invention was made as taught by Brower who teach that soy ink is a general purpose and highly permanent ink (Column 1, line 58-Column 2, line 17). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to use the soy ink of Brower in the scanning device of Lehman based on its highly permanent characteristics as taught by Brower (Column 1, line 58-Column 2, line 17).

Regarding Claim 7, Lehman et al disclose a method comprising prior to scanning an array, calibrating (i.e. pre-scan calibration) an interrogating light power versus a control signal, scanning the light across multiple sites on an array (i.e. lines on a document), detecting signals

from the site emitted in response to interrogating light, and altering the light power for a site on the array during the scanning based on a determination that the emitted signal will be outside a predetermined range (Column 5, line 22-Column 6, line 32). Lehman teaches document scanning wherein the document comprises lines comprised of letters (Column 2, lines 17-30) which clearly suggests the arrayed letters are ink on a page. Lehman does not specifically teach an ink composition. However, biopolymer inks were well known in the art at the time the claimed invention was made as taught by Brower who teach that soy ink is a general purpose and highly permanent ink (Column 1, line 58-Column 2, line 17). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to use the soy ink of Brower in the scanning device of Lehman based on its highly permanent characteristics as taught by Brower (Column 1, line 58-Column 2, line 17).

Regarding Claim 10, Lehman et al discloses the method wherein the power is reduced based on a determination that an emitted signal would exceed a predetermined value i.e. adjusted (Column 6, lines 2-32 and Column 11, lines 3-48).

Regarding Claim 11, Lehman et al discloses the method wherein the determination is based on an emitted signal from the first site i.e. based on the pre-scan calibration signal (Column 3, lines 1-24 and Column 11, lines 3-48).

4. Claims 1-5, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bengtsson (U.S. Patent No. 6,078,390, filed 4 May 1998) in view of Rava et al (U.S. Patent No. 5,874,219, filed 9 April 1996).

Regarding Claim 1, Bengtsson teaches a method comprising: scanning an interrogating light across multiple sites on an array package wherein the scanned sites include multiple

features of the array; detecting signals from respective scanned sites emitted in response to the interrogating light; and decreasing the interrogating light power for a first site on the array package during the array scanning (Column 8, lines 11-17). Bengtsson specifically teaches low-power scanning during calibration of a calibration area, which is "preferably" a "portion of the microarray....the area may be selected by drawing a box around the area" (Column 6, lines 26-30). The selected portion, as described by Bengtsson, is physically distinct from the remaining portions of the microarray. Bengtsson further teaches the scanning light across a first line of the calibration area and decreasing power of the light (Claim 1, (B-D)). The first line is physically outside the remaining lines of the calibration area and/or array.

Bengtsson teaches the method wherein the multiple sites on the array are elements arranged in the commonly known microarray (Column 5, lines 28-31) but they do not specifically teach their microarray includes an addressable array of multiple features of different moieties. However, microarray including an addressable array of multiple features of different moieties were well known in the art at the time the claimed invention was made as taught by Rava et al (Abstract). Rava et al teach a similar method comprising: scanning an interrogating light across multiple sites on an array package which scanned sites include multiple features of the array; detecting signals from respective scanned sites emitted in response to the interrogating light (Column 5, lines40-56) wherein the array includes an addressable array of multiple features of different moieties (Column 2, lines 35-42) and wherein the method provides for high throughput assays thereby improving efficiency of assay performance (Column 4, lines 33-40).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the addressable multiple feature arrays of Rava et al to the microarray detection of Bengtsson to thereby detect high throughput assays for the expected benefit of improving efficiency of assay performance as taught by Rava et al (Column 4, lines 33-40).

Regarding Claim 2, Bengtsson teaches the method wherein the interrogating light power is reduced based on a determination that the emitted signal would exceed a predetermined value (Column 2, lines 22-39 and Column 6, lines 44-64).

Regarding Claim 3, Bengtsson teaches the method wherein the interrogating light power is increased based on a determination that the emitted signal will be below a predetermined value (Column 2, lines 22-39 and Column 6, lines 44-64)

Regarding Claim 4, Bengtsson teach the method wherein the determination is based on the emitted signal detected from the first site (Column 6, lines 23-29).

Regarding Claim 5, Bengtsson teach a method comprising scanning interrogating light across multiple sites of an array detecting signal from respective scanned sites emitted in response to the light and altering the power of the interrogating light for a first site which is an array feature and wherein interrogating light power is altered based on the signal emitted from the first site when the light initially illuminates the first site (i.e. scan line 301 is scanned, attenuation is adjusted (power decreased) to avoid saturation, Column 5, lines 43-47 and Column 49-64). The claim is drawn to altering light power during scanning. The scanning method of Bengtsson as illustrated in Fig. 3 encompasses scanning of multiple lines/rows. Bengtsson specifically teaches altering power "automatically and iteratively" during the scanning operation (Column 7, line 61-Column 8, line 5). Furthermore, Bengtsson specifically teaches use of a power modulator that turns off, for a fraction of dot scanning (Column 8, lines 14-18). Hence, in response to illumination of a dot, the system adjusts power by turning power off.

Regarding Claim 18, Bengtsson teaches a method comprising scanning an interrogating light across multiples sites on an array package (microarray), detecting signals from scanned sites emitted in response to interrogating light and altering power of interrogating light (using power modulator) for a first site during array scanning based location of the site (i.e. for each

dot (location) in the scan, the system turns off the laser) thereby power is altered during a row scan of the interrogating light (Column 8, lines 11-23).

Regarding Claim 19, Bengtsson et al teaches the method the microarray is arranged in rows (Fig. 2 and Column 28-40). Furthermore, Rava provide motivation for providing microarray having the row arrangement i.e. instrumentations exists for handing and reading this format and hence using the known format does not require extensive re-engineering (Column 8, lines 51-56 and Column 10, lines 40-44). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the row arrangement of Rava et al to the microarray of Bengtsson et al based on the advantages taught by Rava et al i.e. instrumentations exists for handing and reading this format and hence using the known format does not require extensive re-engineering (Column 8, lines 51-56).

Regarding Claim 20, Bengtsson teaches line by line scanning (Fig. 3) which clearly suggests row by row scanning and Rava et al teach that technology exists for reading microarrays arranged in rows (Column 10, lines 40-44). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to read the microarray of Bengtsson by scanning row by row as they suggest based on the availability of technologies for reading microarrays arranged in row format as taught by Rava (Column 10, lines 40-44).

Response to Arguments

5. Applicant argues that Bengtsson teaches the calibration area within the array and not outside as instantly claimed. The argument has been considered but is not found persuasive because, as stated above, Bengtsson specifically teaches scanning during calibration of a calibration area, which is "preferably" a "portion of the microarray....the area may be selected by drawing a box around the area" (Column 6, lines 26-30). The selected portion, as described by Bengtsson, is physically distinct from the remaining portions of the microarray. Bengtsson further teaches the scanning light across a first line of the calibration area and decreasing

power of the light (Claim 1, (B-D)). The first line calibration area is physically outside the remaining lines of the array.

Applicant asserts that Claim 5 is drawn to adjusting light power during the process of scanning a line based on a single from a site upon initial illumination. Applicant argues that Bengtsson does not teach this initial response. The argument has been considered but is not found persuasive. Bengtsson specifically teaches use of a power modulator that turns off, for a fraction of dot scanning (Column 8, lines 14-18). Hence, in response to finding a dot, the system adjusts power by turning power off.

Applicant argues that Bengtsson does not teach turning off power is based on locations of individual elements as claimed. Because the Bengtsson specifically teaches "power modulator 500 that controls laser excitation sources 12a and 14a to essentially turn the lasers 12 and 14 off for some fraction of the time that the system is scanning across a scan line.....Specifically, the system turns off the lasers for a fraction of the scanning of each element or dot in the scan line. (Column 8, lines 12-18). Because Bengtsson turns the lasers off for each element or dot while scanning the location of that element or dot, the lasers are turned off (power is altered) based on the location of that element or dot.

6. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bengtsson (U.S. Patent No. 6,078,390, filed 4 May 1998) in view of Rava et al (U.S. Patent No. 5,874,219, filed 9 April 1996) and Lehman et al (U.S. Patent No. 5,237,172, issued 17 August 1993).

Regarding Claim 7, Bengtsson teaches a method comprising: calibrating an interrogating light power versus a control signal characteristic from a light system which provides the interrogating light of a power which varies in response to the control signal

characteristic; scanning an interrogating light across multiple sites on an array package which scanned sites include multiple features of the array; detecting signals from respective scanned sites emitted in response to the interrogating light; and altering the interrogating light power for a first site on the array package during the scanning step (Column 8, lines 11-23) based on location of the first site or on a determination that the emitted signal from the first site will be outside a predetermined range absent the altering (Column 6, line 1-Column 7, line 60).

Bengtsson also teaches "power modulator 500 that controls laser excitation sources 12a and 14a to essentially turn the lasers 12 and 14 off for some fraction of the time that the system is scanning across a scan line. Hence, the system turns off the lasers for a fraction of time during the row scanning (Column 8, lines 12-18).

Bengtsson teaches the method wherein the multiple sites on the array are elements arranged in the commonly known microarray (Column 5, lines 28-31) but they do not specifically teach their microarray includes an addressable array of multiple features of different moieties. However, microarray including an addressable array of multiple features of different moieties were well known in the art at the time the claimed invention was made as taught by Rava et al (Abstract). Rava et al teach a similar method comprising: scanning an interrogating light across multiple sites on an array package which scanned sites include multiple features of the array; detecting signals from respective scanned sites emitted in response to the interrogating light (Column 5, lines40-56) wherein the array includes an addressable array of multiple features of different moieties (Column 2, lines 35-42) and wherein the method provides for high throughput assays thereby improving efficiency of assay performance (Column 4, lines 33-40).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the addressable multiple feature arrays of Rava et al to the microarray scanning of Bengtsson to thereby scan and detect high throughput assays for the

expected benefit of improving efficiency of assay performance as taught by Rava et al (Column 4, lines 33-40).

Bengtsson and Rava do not teach a step of pre-calibration prior to scanning. However, Lehman et al teach a similar method comprising pre-calibration performed prior to scanning their array wherein the pre-calibration coupled with calibration during the scan (dynamic calibration) provides optimized data collection at a throughput rate determined by the maximum rate of scanning (Abstract). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the pre-calibration step of Lehman et al to the calibration method of Bengtsson for the expected benefit of providing optimized data collection at a rate equal to maximum rate of scanning as taught by Lehman (Abstract).

Regarding Claim 8, Bengtsson teach the method wherein a microarray is scanned (Column 5, liens 27-67 but they do not teach that their scanning is repeated for each of multiple array packages. However, Rava et al teach the similar method wherein multiple arrays are scanned (Column 4, lines 24-30 and Column 5, lines 40-56)) and wherein the method provides for high throughput assays thereby improving efficiency of assay performance (Column 4, lines 33-40).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the multiple array scanning of Rava et al to the microarray scanning of Bengtsson to thereby scan and detect high throughput assays for the expected benefit of improving efficiency of assay performance as taught by Rava et al (Column 4, lines 33-40).

Regarding Claim 9, Bengtsson teaches the method wherein the light system includes a light source and an optical attenuator through which light from the source passes to provide the interrogating light and wherein the control signal comprises a signal from the optical attenuator which provides a variable attenuation in response to the characteristic of the control (Column 3, line 32-Column 4, line 7).

Regarding Claim 10, Bengtsson teaches the method wherein the interrogating light power is reduced based on a determination that the emitted signal would exceed a predetermined value (Column 2, lines 22-39 and Column 6, lines 44-64).

Regarding Claim 11, Bengtsson teach the method wherein the determination is based on the emitted signal detected from the first site (Column 6, lines 23-43).

Response to Arguments

7. Applicant argues that Bengtsson does not teach power alteration during a row scan. The argument has been considered but is not found persuasive because as stated above, Bengtsson teaches "power modulator 500 that controls laser excitation sources 12a and 14a to essentially turn the lasers 12 and 14 off for some fraction of the time that the system is scanning across a scan line. Hence, the system turns off the lasers for a fraction of time during the row scanning (Column 8, lines 12-18).

Conclusion

8. No claim is allowed.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (571) 272-0745. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the

number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

BJ Forman, Ph.D.
Primary Examiner
Art Unit: 1634
August 12, 2005